



AMITY UNIVERSITY  
— R A J A S T H A N —

Amity School of Engineering and Technology

Minutes of Board of Studies

2018-2019

**AMITY UNIVERSITY RAJASTHAN, JAIPUR  
AMITY SCHOOL OF ENGINEERING & TECHNOLOGY**

**BOARD OF STUDIES (BOS) of ASET**

Minutes of the meeting of the ASET, Board of Studies held on 22nd Nov, 2018 in the office of Director-ASET.

**Present Members:**

1. **Prof. (Dr.) D.D. Shukla** : Chairman  
(Director – ASET)
2. **Prof. (Dr.) G. K. Aseri** : Member  
(Dy. Dean Academics)
3. **Prof. (Dr.) G.D. Agarwal** : Member  
(Associate Professor, MNIT, Jaipur)
4. **Dr.Pankaj k Pandey** : Member  
(Associate Professor)
5. **Mr. Pankaj Sharma** : Member  
(Assistant Professor)
6. **Dr. Tarun Kumar Sharma** : Member  
(Associate Professor)
7. **Mr. Mangal Singh Sisodiya** : Member  
(Assistant Professor)
8. **Dr. Ashutosh Tripathi** : Member  
(Assistant Professor)



**AMITY UNIVERSITY RAJASTHAN, JAIPUR**  
**AMITY SCHOOL OF ENGINEERING & TECHNOLOGY**

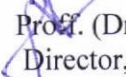
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Date: 22/11/2018

Subject: BOS Meeting Thursday 22<sup>nd</sup> Nov 2018 at AMITY School of Engineering & Technology

**The agenda items were taken up and after considerable deliberations amongst the BOS members, the following decisions were taken:**

1. The Board of studies meeting, for all department of Amity school of Engineering & Technology is convened on Thursday 22<sup>nd</sup> Nov 2018 to consider the following agenda items.
2. To consider the amendments as suggested by Industry Advisory Board in curriculum of all Programmes.
3. To implement in the course content according to the industry 4.0

  
Prof. (Dr.) D.D. Shukla  
Director, ASET



**Proceeding of the meeting-**

1. The members approved the necessary amendments in Program structure of All Progrmaes for all new and old batches
2. The members approved the programme structure as per the recommendation from IAC board



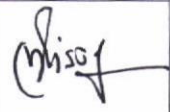
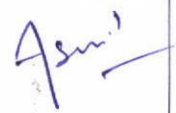


The meeting ended with thanks to the chair and also thanks to external subject/industry experts.





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**ATTENDANCE SHEET FOR BOS MEETING DATED 22/11/2018**

S.NO.	NAME	DESIGNATION	DETAILS	SIGNATURE
1	Prof.(Dr.) D.D. Shukla	Director - ASET	Chairperson	
2	Prof.(Dr.) G.K. Aseri	Dy. Dean, Academics	Member	
3	Prof. (Dr.) G.D. Agarwal	Associate Professor, MNIT, Jaipur	Member	
4	Dr.Pankaj k Pandey	Associate Professor - ASET	Member	
5	Mr. Mangal Singh Sisodiya	Assistant Professor - ASET	Member	
6	Dr Ashutosh Tripathi	Assistant Professor - ASET	Member	
7	Dr Tarun Kumar Sharma	Associate Professor - ASET	Member	
8	Mr. Pankaj Sharma	Assistant Professor - ASET	Member	





# AMITY UNIVERSITY

RAJASTHAN

Course Name	Course Code	LTP	Credit	Semester
MATLAB THEORY AND PRACTICE	BEE 528	2:0:0	2	5

### Course Objective:

To impart the knowledge on MATLAB software widely used for analysis in Control Systems.

### Course Contents:

#### Module I

Introduction, MATLAB environment- Command, History, Directory, launch pad, Workspace, Array editor and Figure windows.

#### Module II

MATLAB features, variables, keywords, output formats, Help provisions, m-files.

#### Module III

Input of vectors and matrices, matrix functions, eigen values and eigen vectors, Transfer function and polynomial commands, symbolic math commands and toolbox features.

#### Module IV

MATLAB LTI viewer and Simulink LTI viewer, SISO design tool.

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
Att: Attendance.

### Text & References:

- Chapman- "MATLAB programming for Engineers", Thomson Learning.
- Hanselman and Littlefield- "Mastering MATLAB", Prentice Hall.





# AMITY UNIVERSITY

RAJASTHAN

Course Name	Course Code	LTP	Credit	Semester
MODERN AND DIGITAL CONTROL ENGINEERING	<b>BEE 503</b>	2:1:0	3	5

### Course Objective:

The basic objective of the course is to impart knowledge to the students on modern control theory and design of control systems.

### Course Contents:

#### Module I:

##### Control System Components

Basic components, amplifiers, plants, transducers, error detectors, servo systems and regulator, DC and AC position and speed control systems.

##### Design of Feedback control systems

Introduction, cascade compensation networks, phase lag and lead design using Bode and Root locus plots

#### Module II:

##### Modern theory

Introduction- State variables, state differential equations( homogeneous and non-homogeneous), Solution, state transition matrix- properties and computation, Laplace solution of state equations, transfer function matrix, representation of state equations in term of state transition matrix, characteristic equation

**Modeling-** state variable modeling, state model signal flow graph, state models-physical, phase, Jordan, similarity transformation, other useful transformation- controllability and observability canonical, diagonal canonical, Jordan canonical Decomposition- direct, cascade, parallel. Controllability and observability – introduction, definition, tests, theorems, rank of a matrix, output controllability, duality theorem, pole- zero cancellation

**Design-**state feedback, relationship with closed-loop transfer function, pole placement and assignment, design of controller by transformation, Observer design, Ackerman's formula

#### Module III:

##### Discrete time signals and systems

Introduction, SDC systems, sampling and data reconstruction.

**Transform analysis of discrete systems:** Introduction, linear difference equations, the pulse T.F. and pulse response, Z-transform equivalence of Zdomain to S-domain, stability analysis.

#### Module IV:







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## Design of digital controls

Introduction, design of a positional Servomechanism, digital PID controller, multivariable controllers.

### Module V:

**State space models of discrete time systems:** Introduction, discrete time state equation and solution, design examples, concepts of controllability and observability Liapunov stability analysis.

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
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### Text & References:

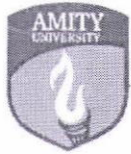
#### Text:

- R C Dorf, "Modern Control Systems", Pearson Education
- J. Nagrath & M. Gopal, 2000, "Control System Engineering", New Age International.
- Norman S Nise, "Control system Engineering", Wiley publishers

#### References:

- M, K. Ogata, 2002, "Modern Control Engineering, PHI.
- B. C. Kuo, 2001, "Automatic Control system, Prentice Hall of India





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## E-COMMERCE AND ERP

**Course Code:** BCS407

**Credit Units:** 04

### **Course Objective:**

This course examines the evolution of enterprise resource planning (ERP) systems - from internally focused client/server systems to externally focused e-business. This class studies the types of issues that managers will need to consider in implementing cross-functional integrated ERP systems. The objective of this course is to make students aware of the potential and limitations of ERP systems. This objective will be reached through hands-on experience, case studies, lectures, guest speakers and a group project. The course would equip students with the basics of E-Commerce, technologies involved with it and various issues associated with.

### **Course Contents:**

#### **Module I: Introduction and Concepts**

**Networks and commercial transactions** - Internet and other novelties; Networks and electronic transactions today, Model for commercial transactions; Internet environment - internet advantage, world wide web and other internet sales venues; Online commerce solutions.

**Security Technologies:** Why is internet insecure? A brief introduction to Cryptography; Public key solution. Digital payment systems; First virtual internet payment system; cyber cash model Operational process of Digicash, Ecash Trail; Using Ecash; Smart cards; Electronic Data Interchange: Its basics; EDI versus Internet and EDI over Internet.

#### Module II: Introduction ERP

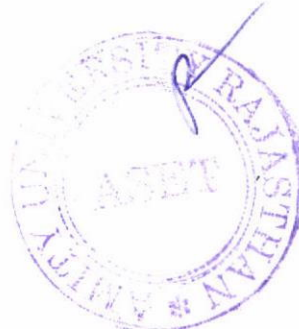
**An Overview, Enterprise-An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, On-line Analytical Processing (OLAP), Supply Chain Management**

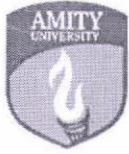
#### **Module III: ERP Implementation**

To be or not to be, ERP Implementation Lifecycle, Implementation Methodology, Not all Packages are Created Equal!, ERP Implementation-The Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring, After ERP Implementation.

#### **Module IV: The Business Modules**

Business Modules in an ERP Package, Finance, Manufacturing (Production), Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution





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### Module V: The ERP Market

ERP Market Place, SAP AG, PeopleSoft, Baan Company, JD Edwards World Solutions Company, Oracle Corporation, QAD, System Software Associates, Inc. (SSA)

### ERP-Present and Future

Turbo Charge the ERP System, Enterprise Integration Applications (EIA), ERP and E-Commerce, ERP and Internet, Future Directions in ERP, Appendices"

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

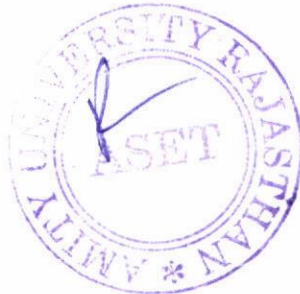
### Text & References:

#### Text:

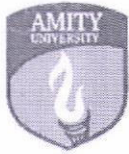
- S. Sadagopan, "Enterprise Resource Planning", Tata McGraw Hill 2000
- Bajaj, Kamlesh K. and Nag, Debjani, E-Commerce: The Cutting Edge of Business, Tata McGraw-Hill Publishing Company

#### References:

- Alexis Leon, "Enterprise Resource Planning", Tata McGraw Hill 2001
- Loshin, Pete and Murphy, Paul, *Electronic Commerce*, Second edition, 1990, Jaico Publishing House, Mumbai.







## WEBSITE DESIGN

Course Code: BCS 406

CreditUnits: 03

### Course Contents:

#### Module I: Overview of Internet

Introduction to Internet and WWW, Concept of Networking and Layers of OSI Model, Internet protocols like TCP/IP, http, telnet and ftp, URL, email, domain name, Web Browsers.

#### Module II: Principles of Web Design

Key issues to be considered in web site design. Structure of a Web Page: Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, HTML Editors & Tools: Use of different HTML editors and tools like Netscape Communicator and Microsoft Front Page etc

#### Module III: HTML Tags

Use of Different HTML tags in web pages. Table Handling: Table layout & presentation, constructing tables in a web page, developing a web page in a table. Ordered and unordered lists. Frames: Developing Web pages using frames. Advantages and disadvantages of frames. Creating forms, Role of Databases in web applications. Use of at least one graphical and animation tools like Adobe Fireworks, Adobe Photoshop, Gif Animator, Gimpetc.

#### Module IV: Cascading style-sheet (CSS) in HTML

Introduction to Cascading Style Sheets (CSS), Types of Style Sheets (Inline, Internal and External), CSS for Website Layout and Print Layout. Types of various CSS Selectors, CSS properties: Type Properties, Background Properties, Block Properties, Box Model Properties, List Properties, Border Properties, Positioning Properties.

#### Module V: Introduction to Java Script

Role of java script in a web page, Script writing basics, Adding interactivity to a web page, creating dynamic web pages, Similarities to java, embedding JavaScript code, embedding java applets in a web page, Form validation using java script

#### Projects:

Creating a discussion form, creating an online store, creating a job site.

#### Examination Scheme:

Components	CA	A	CT	EE
Weightage (%)	30	5	15	50







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CT: Class Test, HA: Home Assignment, CA: Continuous Assessment, EE: End Semester Examination; A Attendance

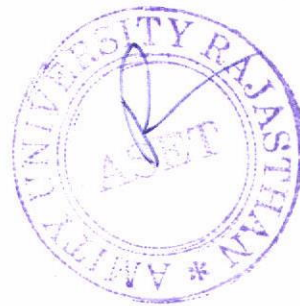
## Text & References:

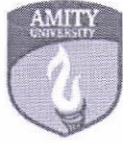
### *Text:*

- Ramesh Bangia, "Web Technology", Firewall media
- C. Xavier, "World Wide Web Design with HTML", Tata McGraw Hill.
- Unleashed ASP, Techmedia

### *References:*

- Rick Dranell, "HTML4 unleashed", Techmedia Publication.
- Shelly Powers, "Dynamic Web Publishing Unleashed", Techmedia.
- Don Gosselin, "JavaScript", Vikas Publication
- **Mark Swank & Drew Kittel, "World Wide Web Database", Sams net.**





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## PROJECT

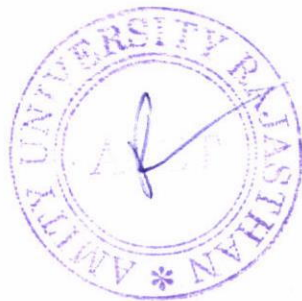
**Course Code: BTH 860**

**Credit Units: 12**

This project course is in continuation of project course allotted in the beginning of the VII the semester. Here the students are supposed to do the detail work as scheduled in the last semester. Finally he/she will be required to submit a detailed project report on which viva-voce examination will be conducted by a committee having one External Examiner.

**Examination Scheme:**

Literature study/ Fabrication/ Experimentation	40
Written Report	20
Viva	15
Presentation	25
Total	100





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## SEMINAR

**Course Code: BTH 760**

**Credit Units: 03**

The student would be allotted a project in the beginning of the VII semester itself. The project will be based on the industry where he/she has undergone in plant training in industry during summer vacations. He/She would be expected to submit a detailed plant design report later in the (VIII) semester. In this semester he/she will be assessed for the work that he/she does during the seventh semester under the supervision of a faculty of the department.

### Examination Scheme:

Literature study/ Fabrication/ Experimentation	40
Written Report	20
Viva	15
Presentation	25
Total	100





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## INDUSTRIAL TRAINING

**Course Code: BTH 750**

**Credit Units: 03**

### Methodology:

Practical training is based on the theoretical subjects studied by students. It can be arranged within the college or in any related industrial unit. The students are to learn various industrial, technical and administrative processes followed in the industry. In case of on-campus training the students will be given specific task of fabrication/assembly/testing/analysis. On completion of the practical training the students are to present a report covering various aspects learnt by them, and give a presentation on same.

### Examination Scheme:

Feedback from industry/work place	30
Training Report	30
Viva	15
Presentation	25
<b>Total</b>	<b>100</b>





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## WEB WEVELOPMENT LAB

**Course Code: BCS 530**

**Credit Units: 01**

**Software Required: Java**

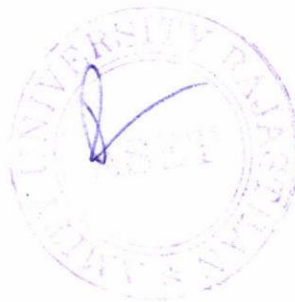
### List of Assignment:

1. Design a HTML page using all the basic tags.
2. Design a page containing your educational qualification in a table.
3. Design a page containing an ordered list/unordered list.
4. Design a HTML page for your resume.
5. Design a form in HTML to enter different attribute of student information.
6. Design a home page for ASE using Frame.
7. Design another page and connect these to the home page.
8. Write a function in Javascript for input validation.
9. Write a function in Javascript to calculate monthly installation of the loan.
10. Write an input form and save its data in a database using ASP.
11. Display the data stored in database in tabular form on the page.

### Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.







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### WEB DEVELOPMENT

**Course Code: BCS 510**

**Credit Units: 03**

**Course Objective:**

To design web base and context aware systems to acquire, organize process, share and use the knowledge of web sites. The field of web site is multidisciplinary as web sites are amazingly complex systems. The major objective of this course is to provide a sound foundation to the students on the concepts, percepts and practices in a field that is of immense concern to the industry and business.

**Course Contents:**

**Module I: Overview of Internet**

Introduction to Internet and WWW, Concept of Networking and Layers of OSI Model, Internet protocols like TCP/IP, http, telnet and ftp, URL, email, domain name, Web Browsers.

**Module II: Principles of Web Design**

Key issues to be considered in web site design. Structure of a Web Page: Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, HTML Editors & Tools: Use of different HTML editors and tools like Netscape Communicator and Microsoft Front Page etc

**Module III: HTML Tags**

Use of Different HTML tags in web pages. Table Handling: Table layout & presentation, constructing tables in a web page, developing a web page in a table. Ordered and unordered lists. Frames: Developing Web pages using frames. Advantages and disadvantages of frames. Creating forms, Role of Databases in web applications.

Use of at least one graphical and animation tools like Adobe Fireworks, Abode Photoshop, Gif Animator, Gimp etc.

**Module IV: Cascading style-sheet (CSS) in HTML**

Introduction to Cascading Style Sheets (CSS), Types of Style Sheets (Inline, Internal and External), CSS for Website Layout and Print Layout.

Types of various CSS Selectors, CSS properties: Type Properties, Background Properties, Block Properties, Box Model Properties, List Properties, Border Properties, Positioning Properties.

**Module V: Introduction to Java Script**

Role of java script in a web page, Script writing basics, Adding interactivity to a web page, creating dynamic web pages,

Similarities to java, embedding JavaScript code, embedding java applets in a web page, Form validation using java script

**Projects:**

Creating a discussion form, creating an online store, creating a job site.

**Examination Scheme:**

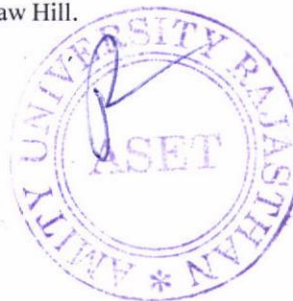
Components	A	V	H	CT	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
Att: Attendance

**Text:**

- Ramesh Bangia, "Web Technology", Firewall media
- C. Xavier, "World Wide Web Design with HTML", Tata McGraw Hill.
- Unleashed ASP, Techmedia

**References:**





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- Rick Dranell, "HTML4 unleashed", Techmedia Publication.
- Shelly Powers, "Dynamic Web Publishing Unleashed", Techmedia.
- Don Gosselin, "JavaScript", Vikas Publication
  - Mark Swank & Drew Kittel, "World Wide Web Database", Sams net.







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## MECHANICAL OPERATIONS

**Course code: BTH 403**

**Credit units: 04**

### Course Objective:

This course would impart an understanding that the industrial processes contain a coordinated series of separation operations and thus enable them decide the best technique for a particular process

### Course Contents:

#### Module I: Particle Size and shape

Measurement and Analysis, screening and screen analysis, screen effectiveness, Design of industrial screening equipment., Size Reduction

#### Module II: Particle separation

Sedimentation, Free and hindered settling, Thickeners and settling chambers, characteristics of rotating fluids, Centrifuges, cyclone separators, bag filters, Electrostatic precipitator

#### Module III: Flow through porous media

Constant pressure and constant rate filtration, Compressible and incompressible cakes, Filtration rate calculation, Filtration equipment

#### Module IV: Flow through packed bed

Packing materials and their characteristics, Bed porosity and packing area., Pressure drop, Flooding and loading.

#### Module V: Fluidization

Pressure drop and minimum fluidization , Liquid and gas fluidization velocity

#### Module VI: Solid handling

Storage of solids-bins, cellos, hoppers, Transport of solids-screw and belt conveyors, pneumatic and hydraulic transport, Mixing of solids and pastes.

### Examination Scheme:

Components	A	V	H	CT	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
Att: Attendance

### Text Books:

- Brown, G.G., "Unit Operations" CBS Publishers & Distributors, New Delhi
- McCabe, W.L., Smith J.C. and Harriot, P., "Unit Operations in chemical engineering", McGraw-Hill Inc.

### References:

- Coulson, J. M., and Richardson, J.F., "Chemical Engineering, Volume 2", Pergamon Press.





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## DOMAIN ELECTIVE-I MATERIAL SCIENCE

**Course Code: BTH 305**

**Credit Units: 04**

### Course Objective:

Metallurgy and Materials deal with the structure and properties of all materials, which have engineering applications. Metallurgists and Materials Engineers are responsible for designing, producing, examining and testing materials as diverse as metallic engineering alloys, semiconductors and superconductors, ceramics, plastics and composites. This course will help students understand the properties of different types of materials and their applications.

### Course Contents:

#### Module I

Atomic structure of metals crystal structure, crystal lattice of (i) Body centered cubic (ii) face centered cubic (iii) closed packed hexagonal, crystallographic notation of atomic planes, polymorphism and allotropy, solidification of crystallization (i) nuclear formation (crystal growth) (ii) crystal imperfection Elementary treatment of theories of plastic deformation, phenomenon of slip twinning, dislocation, identification of crystallographic possible slip planes and direction in FCC, BCC, C.P., recovery, re-crystallization, preferred orientation causes and effects on the property of metals.

#### Module II

Introduction to Engineering materials, their mechanical behaviour, testing and manufacturing properties of materials, physical properties of materials, classification of engineering materials.

#### Module III

General principles of phase transformation in alloys, phase rule and equilibrium diagrams, Equilibrium diagrams of Binary system in which the components form a mechanical mixture of crystals in the solid state and are completely mutually soluble in both liquid state. Equilibrium diagrams of a systems whose components have complete mutual solubility in the liquid state and limited solubility in the solid state in which the solid state solubility decreases with temperature. Equilibrium diagram of alloys whose components have complete mutual solubility in the liquid state and limited solubility in solid state (Alloy with a peritectic transformation) Equilibrium diagrams of a system whose components are subject to allotropic change.

#### Module IV

Principles and applications of heat treatment processes viz. annealing, normalizing hardening, tempering; harden ability & its measurement, surface hardening processes. Defects in heat treatment and their remedies; effects produced by alloying elements on the structures and properties of steel. Distribution of alloying elements (Si, Mn, Ni, Cr, Mo, TL, Al) in steel.

#### Module V

Ceramic: Structure ; application and processing; Clays; Refractories; Abrasives; cement  
Introduction to nano-materials and structure sensitive materials

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

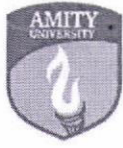
CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
Att: Attendance

### Text Books:

- V. Raghavan, "Material Science & Engineering", Prentice Hall India Ltd., 2001.







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- Shackelford, J.F. and Muralidhara, M.K., Introduction to Material Science for Engineers (6/e), Pearson Education, 2007
- S.K. Hazra Chaudhuri, "Material Science & Processes", Indian Book Publishers, Calcutta, 1983.
- R.B. Gupta, "Material Science Processes", Satya Prakashan, New Delhi, 2000.

*References:*

- Raymond A Higgim., "Engineering Metallurgy Part 1", Prentice Hall India, New Delhi, 1998.
- Buduisky et al, "Engineering Materials & Properties", Prentice Hall India, New Delhi, 2004.
- Peter Haasten, "Physical Metallurgy", Cambridge Univ. Press, 1996.





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Course Name	Course Code	LTP	Credit	Semester
TRANSPORTATION ENGINEERING - I	BCE 404	3:0:0	3	4

## SYLLABUS

### Module I: Highway Classification,

Introduction - Transportation Modes and their comparison, Importance of Highway Transportation, Highway development in India, Classification of roads, Road Patterns, Cross sections of roads in urban and rural area. Scope of highway and traffic engineering. Highway planning - basic principles

### Module II: Alignment and Geometrical Design

Requirements and factors controlling alignment of roads, Engineering surveys for highway location, Pavement surface characteristics, Camber and width requirements, Sight distances - stopping and overtaking sight distances, overtaking zone requirements. Design of horizontal alignment - speed, radius, superelevation, methods of providing super elevation, extra widening of pavements, transition curves. Design of vertical alignment - gradient, grade compensation, summit curves and valley curves.

### Module III: Traffic engineering

Introduction, Road user, vehicle and traffic characteristics, PCU and axle load survey, Capacity and Level of service. Speed and volume studies; Intersections - Types; Traffic signs and markings - Objective, classification and uses. Highway safety measures.

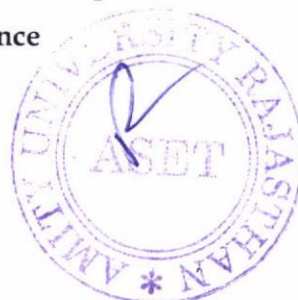
### Module IV: Pavement Materials and Design

Desirable properties and testing of highway materials: subgrade soil, road aggregates, bituminous materials and Tar, fly-ash.

Design of Flexible pavements - CBR method and IRC guidelines

Design of Rigid pavements using IRC charts - worked out problems.

### Module V: Pavement Construction and Maintenance





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Historical development of road construction -Construction of earth roads, WBM roads, stabilized roads, bituminous pavements, cement concrete roads and joints in cement concrete roads - Types and causes of failures in flexible & rigid pavements.

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

### Text & References:

- Papacostas, C.S., Transportation Engineering and Planning, 3<sup>rd</sup> ed., Pearson Education, New Delhi (2008)
- Khanna, S.K and Justo, C.E.G., Highway Engineering, Nem Chand and Bros.
- Kadiyali, L.R, Traffic Engineering and Transport Planning, Khanna Publishers, New Delhi
- Kadiyali, Principles of Highway Engineering, Khanna Publishers.







# AMITY UNIVERSITY

— R A J A S T H A N —

Course Name	Course Code	LTP	Credit	Semester
Remote Sensing and Geographic Information Systems (Domain Elective)	BCE 307	2:0:0	2	3

## SYLLABUS

### Module I

Concepts and foundations of remote sensing- electromagnetic spectrum, energy sources and radiation principles, energy interactions in the atmosphere and with earth surface features, data acquisition and interpretation, reference data, ideal remote sensing systems, characteristics of real remote sensing systems. Classification of maps, map scale, spatial reference system, map projections, grid systems, linkage of GIS to remote sensing. Radar principle- Factors affecting microwave measurements, radar wavebands, SLAR systems, interaction between microwaves and earth's surface. Elements of photographic systems - film exposure, film density and characteristic curves, spectral sensitivity of black and white films, colour film and colour infrared film, filters, aerial cameras, film resolution, electronic and multi band imaging, aerial videography. Basic principles of photogrammetry - geometrical characteristics of aerial photographs, photographic scale, ground coverage, area measurement, relief displacement of vertical features, image parallax, ground control, mapping.

### Module II

Remote sensing platforms and sensors - Satellite system parameters, sensor parameters, imaging sensor systems, earth resources and meteorological satellites with microwave sensors, scanners, radiometers. The Indian Remote Sensing Program. Data types and format, scale and legend.

Visual Image Interpretation - types of pictorial data products, fundamentals of visual image interpretation, equipment, image interpretation strategy, process of image interpretation, key elements of visual image interpretation, false colour composites, application in natural resources management. Digital Image Processing - Basic character of a digital image, image rectification & restoration, preprocessing, registration, enhancement, contrast, spatial feature and multi-image manipulation, spatial filtering, image transformations, image classification, performance analysis, data merging and GIS integration.

### Module III

GIS overview - what is GIS, components, definitions & terminology, uses, GIS queries & architecture, theoretical models & framework, GIS technology trends, data sources, collection,





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and entry, data formats & standards, types of analysis, spatial data modeling, GIS data management, database models, storage of data, object based GIS models, data input & editing, data quality issues. Data analysis & modeling - Integration of remote sensing & GIS.

### Module IV

Application of Remote Sensing & GIS in natural resources management with specific reference to impact of mining activities on environment, biodiversity, coastal zone protection, flood management, forest protection, monitoring urban growth, managing watersheds & water resources, hydrologic modeling, preventing natural disasters etc.

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

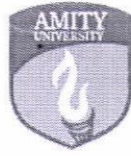
CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

### Text & References:

- Thomas. M. Lillesand and Ralph. W. Kiefer, Remote Sensing and Image Interpretation, John Wiley and Sons, Inc., 2002
- M. Anji Reddy, Text Book of Remote Sensing and Geographical Information Systems, B.S. Publications, 2001
- Ian Heywood, Sarah Cornelius, and Steve Carver, An Introduction to Geographical Information Systems, Pearson Education Asia, 2001
- George. B. Korte, The GIS Book:, Onward Press, Thomson Learning, 2001
- D. P. Rao, Association of Exploration Geophysicists, 1995, Remote Sensing for Earth Resources.
- L.R.A. Narayan, Remote Sensing and its Application, Universities Press, 1999.







## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

Course Name	Course Code	L T P	Credit	Semester
Flexible Manufacturing system	BME-804	3 0 0	3	VIII

### Syllabus:-

#### Module-I

Understanding of FMS: Evolution of Manufacturing Systems, Definition, objective and Need, Components, Merits, Demerits and Applications Flexibility in Pull and Push type

#### Module- II

Classification of FMS Layout: Layouts and their Salient features, Single line, dual line, loop, ladder, robot centre type etc.

#### Module- III

Processing stations: Salient features Machining Centers, Turning centre, Coordinate measuring machine (CMM), Washing/ Deburring station

#### Module- IV

Material Handling System: An introduction, Conveyor, Robots, Automated Guided Vehicle (AGV), Automated Storage Retrieval System (ASRS) Management technology: Tool Management, tool magazine, Tool preset, identification, Tool monitoring and fault detection, routing, Production Planning and Control, Scheduling and loading of FMS

#### Module- V

Design of FMS: Performance Evaluation of FMS, Analytical model and Simulation model of FMS Case studies: Typical FMS problems from research papers

#### A. Evaluation:

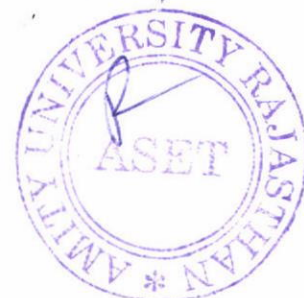
Components	Other Components	Attendance	MTE	ESE
Weightage (%)	30	5	15	50

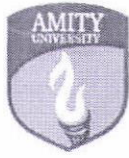
#### D. Text books & References book:

1. William W Luggen, "Flexible Manufacturing Cells and System" Prentice Hall of Inc New Jersey, 1991
2. Reza A Maleki "Flexible Manufacturing system" Prentice Hall of Inc New Jersey, 1991
3. John E Lenz "Flexible Manufacturing" marcel Dekker Inc New York ,1989.

#### References

1. Groover, M.P "Automation, Production Systems and Computer Integrated Manufacturing", Prentice Hall





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— R A J A S T H A N —

## **AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)**

Course Name	Course Code	L T P	Credit	Semester
Electric & Hybrid Vehicles	BME-707	3 0 0	3	VII

### **Syllabus:**

#### **Module I - Introduction**

Introduction to Hybrid Electric Vehicles: History of hybrid and electric vehicles, social and environmental importance of hybrid and electric vehicles, impact of modern drive-trains on energy supplies. Conventional Vehicles: Basics of vehicle performance, vehicle power source characterization, transmission characteristics.

#### **Module II -Hybrid and Electric Drive-trains**

Hybrid Electric Drive-trains: Basic concept of hybrid traction, introduction to various hybrid drive-train topologies, power flow control in hybrid drive-train topologies, fuel efficiency analysis. Electric Drive-trains: Basic concept of electric traction, introduction to various electric drive-train topologies, power flow control in electric drive-train topologies, fuel efficiency analysis.

#### **Module III-Propulsion System**

Introduction to electric components used in hybrid and electric vehicles, Configuration and control of DC Motor drives, Configuration and control of Induction Motor drives, configuration and control of Permanent Magnet Motor drives, Configuration and control of Switch Reluctance Motor drives, drive system efficiency.

#### **Module IV- Energy Storage System**

Introduction to Energy Storage Requirements in Hybrid and Electric Vehicles, Battery based energy storage and its analysis, Fuel Cell based energy storage and its analysis, Super Capacitor based energy storage and its analysis, Flywheel based energy storage and its analysis, Hybridization of different energy storage devices. .

#### **Module V- Testing of Electric Vehicles**

Homologation & its Types, Regulations overview (EEC, ECE, FMVSS, AIS, CMVR), Type approval Scheme. Types of test tracks, Hardware in The Loop (HIL) concepts for EV/HEVs. static testing of vehicle, dynamics testing of vehicle, vehicle component testing.

### **Evaluation:**

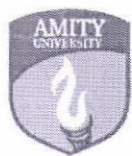
Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	30	50

### **Text:**

- Mehrdad Ehsani, Yimin Gao, Stefano Longo and Kmbiz Ebrahimi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles", CRC Press, 3<sup>rd</sup> edition (2019)
- A.K. Babu, "Electric & Hybrid Vehicles", Khanna Publishing, 1<sup>st</sup> edition (2019).
- Tom Denton, "Electric and Hybrid Vehicles", Routledge; 1<sup>st</sup> edition (2016).
- ARAI Standards for Electric Vehicles (<https://www.araiindia.com/downloads>)







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## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

Course Name	Course Code	L T P	Credit	Semester
TOTAL QUALITY MANAGEMENT	BME 607	3 0 0	3	VI

### Syllabus:

#### Module I: Introduction

Meaning of Quality and quality improvement, need of Quality, Statistical methods for quality control, Process capability.

#### Module II: Quality Control

Statistical Quality Control, control charts, Control charts for attributes & variables, Moving average chart.

#### Module III: Production Control

Acceptance Sampling, OC curve, Sampling Plan, Producer's risk, Consumer's risk, Average Quality Level, AOQL, Design of Single & double sampling plan.

#### Module IV: Quality Assurance

Need of Quality Assurance, Quality Audit, Concept of Zero defect, ISO 9000 quality systems, total quality management.

### A. EXAMINATION SCHEME:

Components	Other Components	Attendance	MTE	ESE
Weightage (%)	30	5	15	50

MTE:Mid-term Examination, ESE: End Semester Examination; A: Attendance

### Text & References:

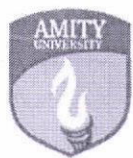
#### Text:

- EL Grant & RS Leavenworth, "Statistical Quality Control", McGraw Hill & Co.
- M. Mahajan, "Statistical Quality Control", Dhanpat Rai & Co.
- O.P. Khanna, "Statistical Quality Control", Dhanpat Rai & Co.
- R.C. Gupta, "Statistical Quality Control", Khanna Publishers

#### References:

- Amitav Mitra, "Fundamentals of Quality Control", Pearson Education
- Feigenbaum, "Total Quality Control", McGraw Hill & Co.
- Suresh Dalela, "Quality Systems", Standard Publishers & Distributors
- Montgomery DC, "Introduction to Statistical Quality Control", John Wiley & Sons Inc.
- Stephan B. Vardeman, J Marcus Jobe, "Statistical QA Methods for Engineers", John Wiley & Sons Inc.
- Taylor J.R., "Quality Control systems", McGraw Hill Int. Education
- K.C. Arora, "Total Quality Management", S.K. Kataria & Sons.





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## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

Course Name	Course Code	L T P	Credit	Semester
Product Design and Development	BME 504	3 0 0	3	V

### A. Syllabus

#### Module I

Need for developing products – the importance of engineering design – types of design –the design process – relevance of product lifecycle issues in design –designing to codes and standards- societal considerations in engineering design –generic product development process – various phases of product development-planning for products –establishing markets- market segments- relevance of market research

#### Module II

Task – Structured approaches – clarification – search – externally and internally – explore systematically – reflect on the solutions and processes – concept selection – methodology – benefits. Identifying customer needs –voice of customer –customer populations- hierarchy of human needs-need gathering methods – affinity diagrams – needs importance- establishing engineering characteristics-competitive benchmarking- quality function deployment- house of quality- product design specification-case studies

#### Module III

Decision making –decision theory –utility theory –decision trees –concept evaluation methods –Pugh concept selection method- weighted decision matrix –analytic hierarchy process – introduction to embodiment design – product architecture – types of modular architecture –steps in developing product architecture, Design for manufacturing - machining - casting and metal forming - optimum design - Design for assembly and disassembly – probabilistic design concepts - FMEA – QFD

#### Module IV

RECENT ADVANCES: Intelligent Information Systems - Knowledge based product and process models - Applications of soft computing in product development process - Advanced database design for integrated manufacturing.

### B. Evaluation:

Components	Other Components	Attendance	MTE	ESE
Weightage (%)	30	5	15	50

### C. Text &reference book

1. George E.Dieter, Linda C.Schmidt, "Engineering Design", McGraw-Hill International Edition, 4th Edition, 2009, ISBN 978-007-127189-9
2. Anita Goyal, Karl T Ulrich, Steven D Eppinger, "Product Design and Development ", 4th Edition, 2009, Tata McGraw-Hill Education, ISBN-10-007-14679-9
3. Kevin Otto, Kristin Wood, "Product Design", Indian Reprint 2004, Pearson Education,ISBN 9788177588217



4. Yousef Haik, T. M. M. Shahin, "Engineering Design Process", 2nd Edition Reprint, Cengage Learning, 2010, ISBN 0495668141
5. Clive L.Dym, Patrick Little, "Engineering Design: A Project-based Introduction", 3rd Edition, John Wiley & Sons, 2009, ISBN 978-0-470-22596-7







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## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

Course Name	Course Code	L T P	Credit	Semester
NON-DESTRUCTIVE TESTING METHODS	BME 408	3 0 0	3	IV

### Course Contents:

**Module I: Introduction:** Fundamentals of and introduction to destructive and non-destructive testing. Scope and limitations of NDT, Visual examination methods, Different visual examination aids.

**Module II: Dye penetrant Testing/ Liquid Penetrant Testing:**

Principle, procedure, characteristics of penetrant, types of penetrants, penetrant testing materials, fluorescent penetrant testing method– sensitivity, application and limitations.

**Module III: Magnetic Particle Testing:**

Important terminologies related to magnetic properties of material, principle, magnetizing technique, procedure, equipment, fluorescent magnetic particle testing method, sensitivity, application and limitations.

**Module IV: Ultrasonic Testing:** Basic principles of sound propagation, types of sound waves, Principle of UT, methods of UT, their advantages and limitations, flaw characterization technique, defects in welded products by UT, Thickness determination by ultrasonic method, Study of A, B and C scan presentations, advantage and limitations.

**Module V: Radiographic Testing:**

X-ray and Gamma-Ray radiography, Their principles, methods of generation, Industrial radiography techniques, inspection techniques, applications, limitations, Types of films, screens and penetrameters. Interpretation of radiographs, Safety in industrial radiography.

**Module VI: Leak and Pressure Testing:**

Definition of leak and types, Principle, Various methods of pressure and leak testing, Application and limitation

**Module VII: Eddy Current Testing**

Principle, instrument , techniques, sensitivity, application, limitation Thermal methods of NDT.

### Evaluation:

Components	Assignment	Viva	MTE	Attendance	ESE
Weightage (%)	15	15	15	5	50

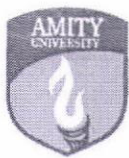
### Text & References:



- Baldev Raj (2009) Practical Non-Destructive Testing- Narosa Publishing House Pvt. Ltd;
- J Prasad , and C. G. Krishnadas Nair (2017) Non-Destructive Test and Evaluation of Materials- McGraw Hill Education.
- Ravi Prakash, ( 2010) Non-Destructive Testing Techniques- New Age International Publishers.
- Lari and Kumar,(2013) Basics Of Non-Destructive Testing, S.K. Kataria & Sons







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## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

Course Name	Course Code	L T P	Credit	Semester
<b>GREEN VEHICLE TECHNOLOGY</b>	BME 308	3 0 0	3	I

### Course Contents:

#### Module I - Introduction

Overview of green vehicles in India. Benefit of using green vehicles. Economic and environmental impact of electric hybrid vehicle. Comparison of hybrid electric vehicles and conventional vehicles. Introduction to Hybrid Electric Vehicles: History of hybrid and electric vehicles, social and environmental importance of hybrid and electric vehicles, impact of modern drive-trains on energy supplies. Conventional Vehicles: Basics of vehicle performance, vehicle power source characterization, transmission characteristics.

#### Module II -Hybrid and Electric Drive-trains

Hybrid Electric Drive-trains: Basic concept of hybrid traction, introduction to various hybrid drive-train topologies, power flow control in hybrid drive-train topologies, fuel efficiency analysis. Electric Drive-trains: Basic concept of electric traction, introduction to various electric drive-train topologies, power flow control in electric drive-train topologies, fuel efficiency analysis.

#### Module III-Propulsion System

Introduction to electric components used in hybrid and electric vehicles, Configuration and control of DC Motor drives, Configuration and control of Induction Motor drives, configuration and control of Permanent Magnet Motor drives, Configuration and control of Switch Reluctance Motor drives, drive system efficiency.

#### Module IV- Energy Storage System

Introduction to Energy Storage Requirements in Hybrid and Electric Vehicles, Battery based energy storage and its analysis, Fuel Cell based energy storage and its analysis, Super Capacitor based energy storage and its analysis, Flywheel based energy storage and its analysis, Hybridization of different energy storage devices. .

#### Module V- Testing of Electric Vehicles

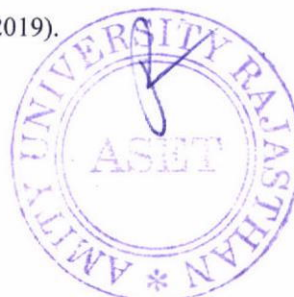
Homologation & its Types, Regulations overview (EEC, ECE, FMVSS, AIS, CMVR), Type approval Scheme. Types of test tracks, Hardware in The Loop (HIL) concepts for EV/HEVs. static testing of vehicle, dynamics testing of vehicle, vehicle component testing.

### Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	30	50

#### Text:

- Mehrdad Ehsani, Yimin Gao, Stefano Longo and Kmbiz Ebrahimi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles", CRC Press, 3<sup>rd</sup> edition (2019)
- A.K. Babu, "Electric & Hybrid Vehicles", Khanna Publishing, 1<sup>st</sup> edition (2019).



- Tom Denton, "Electric and Hybrid Vehicles", Routledge; 1<sup>st</sup> edition (2016).
- ARAI Standards for Electric Vehicles (<https://www.araiindia.com/downloads>)





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— R A J A S T H A N —

## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

Course Name	Course Code	L T P	Credit	Semester
Introduction to Optimization	BME 307	3 0 0	3	III

### Course Contents:

#### Module-I: Introduction

Concept of optimization – classification of optimization – problems.

#### Module-II: Linear Programming .

Examples of linear programming problems – formulation simplex methods variable with upper bounds – principleduality -dual simplex method - sensitivity analysis – revised simplex procedure – solution of the transportation problem – assignment – network minimization – shortest route problem – maximal two problem – L.P. representation of networks

#### Module-III: Queuing Theory

Queuing Model, poisson and exponential distributions -Queues with combined arrivals and departures-random and series queues.

#### Module-IV: Unconstrained Optimization

Maximization and minimization of convex functions. Necessary and sufficient conditions for local minima – speed and order of convergence – univariate search – steepest and descent methods- metcher reeves method -conjugate gradient method.

#### Module-V: Constrained Optimization

Necessary and sufficient condition – equality constraints, inequality constraints -kuhu – tucker conditions – gradient projection method – penalty function methods – cutting plane methods of sibel directions.

### Examination Scheme:

Components	Internal assessment	Attendance	MTE	ESE
Weightage (%)	30	5	15	50

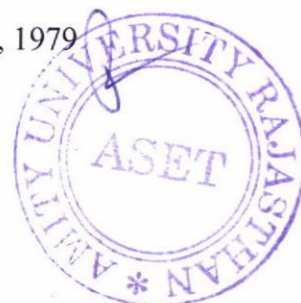
MTE: Mid Term Exam, ESE: End Semester Examination;

### Text & References

#### Text

1. Rao S.S,"Optimization – Theory and applications", Wiley Easter Ltd., 1979

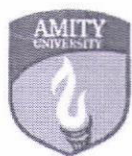
#### References





1. David G.Luerbeggan, "Introduction to Linear and Non Linear Programming", Addison Wesley Publishing Co. 1973.
2. Hadley G. "Nonlinear and – dynamic programming" Addison Wesley Publishing Co. 1964.
3. Cordan C.C. Beveridge and Robert S. Schedther, "Optimization, Theory and Practice" McGraw Hill Co.1970.
4. HarndyA.Tahh. "operations Research, An Introduction", Macmillan Publishers





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— R A J A S T H A N —

## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

### MANUFACTURING PROCESS LAB

Course Code: BME 324

P:02 C:01

#### Course Contents:

1. Operations on the Lathe Machine.
2. Operations on the Shaper Machine.
3. Operations on the Planner Machine.
4. Operations on the Drilling Machine.
5. Operations on the Grinding Machine.
6. Operations on the Milling Machine.
7. To make a Single point cutting tool

#### Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	20	20	5	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.





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## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

Course Name	Course Code	L T P	Credit	Semester
DOMAIN WORKSHOP	BME 206	1 0 0	1	II

### Syllabus

#### Module I: Introduction to workshop

Workshop layout, Importance of various sections/shops of workshop , Types of jobs done in each shop , General safety rules and work procedure in workshop.

#### Module II: Fitting and Carpentry Shop

Introduction , various types of woods, different types of tools, machines and accessories, various marking, measuring, cutting, holding and striking tools, different fitting operation like chipping ,filing, right angle; marking, drilling, tapping etc

#### Module III: Sheet Metal Shop

Introduction, Various types of tools, equipments and accessories, Different types of operations in sheet metal shop, Safety precautions.

#### Module IV: Welding Shop

Introduction types of welding ,ARC welding, Gas Welding, Gas Cutting. welding of dissimilar materials, Selection of welding rod material Size of welding rod and work piece, different types of flame, Elementary Symbolic representation , Safety precautions in welding safety equipments and its use in welding processes..

### Examination Scheme:

Components	Other Components	Attendance	MTE	ESE
Weightage (%)	30	5	15	50

### Text & References:

#### Text:

- Elements of Workshop Technology”, Vol. I 2008 and Vol. II 2010, Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., , Media promoters and publishers private limited,Mumbai.
- “Manufacturing Technology”, Vol. I and Vol. II, 2017, Rao P.N., Tata McGraw Hill House.

#### References:

- “Workshop Technology” Vol. 1 and 2,1998 by Raghuvanshi B.S. Dhanpat Rai & Sons







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— R A J A S T H A N —

## AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY (ASET)

### BASIC ELECTRICAL ENGINEERING LAB

Course Code: BEE 126

P:02, C:01

#### List of Experiments:

1. To verify KVL & KCL in the given network.
2. To verify Superposition Theorem.
3. To verify Maximum Power Transfer Theorem.
4. To verify Reciprocity Theorem.
5. To determine and verify  $R_{Th}$ ,  $V_{Th}$ ,  $R_N$ ,  $I_N$  in a given network.
6. To perform open circuit & short circuit test on a single-phase transformer.
7. To study transient response of a given RLC Circuit.
8. To perform regulation, ratio & polarity test on a single-phase transformer.
9. To measure power & power factor in a three phase circuit by two wattmeter method.
10. To measure power & power factor in a three phase load using three ammeter & three voltmeter method.

#### Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	20	20	5	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.





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## RAJASTHAN

RADAR AND SATELLITE COMMUNICATIONS	BEC 701	3:0:0	3	7
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### Course Objective:

This course builds basic knowledge of different types of Radar systems and satellite communication along with link designing & application. It also covers different modulation schemes & channels used.

### Course Contents:

#### Module I: Introduction to Radar

Principle of detection and ranging, Radar frequencies and bands. Applications, Radar block diagram and operation. Radar Range Equation : Range prediction, Minimum detectable signal, Receiver noise SNR, Integration of radar pulses, Radar cross section of targets, Transmitter Power, PRF and system losses & Propagation effects.

#### Module II: CW FM Radar

Doppler effect, CW Radar, Frequency-modulated CW Radar, Multiple-frequency CW Radar. MTI and Pulse Doppler Radar: MTI delay lines, Delay line Cancellers, Coherent and Non-Coherent MTI, Pulse Doppler Radar.

#### Module III: Introduction to Satellite

Communication satellites, Orbiting satellites, Frequencies and bands, Satellite multiple access formats. Satellite Channel: Power flow; Polarization, Atmospheric losses, Receiver noise, CNR, Satellite link analysis for uplinks and downlinks. Overview of Coaxial cable system and optical Network (SONET); Overview of WLL (Wireless loop)

#### Module IV: Satellite Transponder

Transponder model, Satellite signal processing RF-RF translation, IF demodulation, application

#### Module V: Multiple-Access

FDMA; amplification with multiple FDMA carriers, AM/FM Conversion with FDMA, Switched FDMA, Synchronization, SS-TDMA; CDMA; DS CDMA, Frequency-hopped, CDMA. Carrier recovery & bit timing. Satellite link budget analysis

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
Att: Attendance.

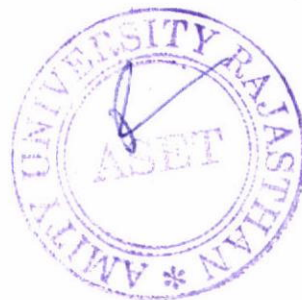
### Text & References:

Text

- Introduction to Radar Systems - M.I. Skolnik
- Radar Fundamentals - G.J. Wheeler.
- Radar Engineering - D.G. Rink
- Satellite Communication - R.M. Gagliardi

Reference

- Satellite Communication - T. Pratt & C.W. Boston







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## RAJASTHAN

ANTENNA AND WAVE PROPOGATION	BEC 801	3:0:0	3	8
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### Course Objective:

The purpose of this course is to provide a thorough introduction to antenna systems with an in depth study of various types & performance parameters for antenna.

### Course Contents:

#### Module I: Antenna

Antenna Principles: Potential Functions & Electromagnetic Field, Current Elements, Radiation from Monopole & Half Wave Dipole, power radiated by current element, radiation resistance. Network Theorems, Directional Properties of Dipole Antenna. Antenna Gain, Effective Area, Antenna Terminal Impedance, Practical Antennas and Methods of Excitation, Antenna Temperature and Signal to Noise Ratio.

#### Module II: Antenna Arrays

Antennas Arrays: Two Element Array, Horizontal Patterns in Broadcast Arrays, Linear Arrays, Multiplication of patterns, effect of the earth on vertical patterns, Binomial array

#### Module III: Wave Propagation

Modes of Propagation, Plane Earth Reflection, Space wave and Surface Wave, Reflection and refraction waves by the Ionosphere Tropospheric Wave. Ionosphere Wave Propagation in the Ionosphere, Virtual Height, MUF Critical frequency, Skip Distance, Duct Propagation, Space wave

#### Module IV: Practical Antennas

VLF and LF transmitting antennas, effect of antenna height, Field of short dipole, electric field of small loop antenna, Directivity of circular loop antenna with uniform current, Yagi-Uda array: Square corner yagi-uda hybrid, circular polarization Rhombic Antenna: Weight and Leg length Parabolic Reflectors: Properties, Comparison with corner reflectors Horn Antenna: Length and Aperture. Introduction to Turstile Antenna Effect of ground on antenna performance. Broadband Antenna: Frequency independent concept, RUMSEY's Principle, Frequency independent planar log spiral antenna, Frequency independent conical spiral Antenna.

#### Module V: Antenna Measurements

Radiation Pattern measurement, Distance requirement for uniform phase, uniform field amplitude requirement, Introduction to phase measurement; Gain Measurement: Comparison method, Near field method, Introduction to current distribution measurement, Measurement of antenna efficiency, measurement of Noise figure and noise temperature of an antenna polarization measurement.

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
Att: Attendance.

### Text & References:

Text:

- Jordan Edwards C. and Balmain Keith G.S "Electromagnetic Waves and Radiating Systems"/ Prentice Hall (India)







# AMITY UNIVERSITY

— R A J A S T H A N —

2. Kraus, John D. & Mashefka, Ronald J. / "Antennas: For All Applications" / Tata McGraw Hill, 3rd Ed.

References:

1. Prasad, K.D./ "Antennas and Wave Propagation"/ Khanna Publications
2. Collin, R. / "Antennas and Radiowave Propagation" / Tata McGraw-Hill
3. Hayt Jr. William H./ "Engineering Electromagnetic" / Tata McGraw-Hill
4. Das, Annaparna & Das, Sisir K. / "Microwave Engineering"/ Tata McGraw Hill.
5. Roy, Sitesh Kumar & Mitra, Monojit / "Microwave Semiconductor Devices" / Prentice Hall (India).

Course Name	Course Code	LTP	Credit	Semester
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# AMITY UNIVERSITY

## RAJASTHAN

Course Name	Course Code	LTP	Credit	Semester
DIGITAL COMMUNICATIONS	BEC 503	3:0:0	3	5

### Course Objective:

The purpose of this course is to provide a thorough introduction to digital communications with an in depth study of various modulation techniques, receiver design & performance analysis are discussed.

### Course Contents:

#### Module I: Digital Communication System Basics

Basic building blocks of Digital communications, analog versus digital communication, Advantages disadvantages of digital communications.

#### Module II: Digital Baseband Transmission

Pulse code modulation, Signal to quantization ratio, non-uniform quantization companding, BW calculations.

#### Module III: Transmission of Analog Samples & Signal Detection in Noise

Delta Modulation, Adaptive delta-modulation, DPCM, ADCM, ADPCM, Matched Filter Receiver, Derivation of Its Impulse Response and Peak Pulse Signal to Noise Ratio. Correlator receiver, Decision Threshold and Error Probability For, Unipolar (ON-OFF) Signaling, ISI, Nyquist Criterion For Zero ISI & Raised Cosine Spectrum

#### Module IV: Digital Modulation Technique

Gram-Schmidt Orthogonalization Procedure, Types of Digital Modulation, Wave forms for Amplitude, Frequency and Phase Shift Keying, Method of Generation and Detection of Coherent & Non-Coherent Binary ASK, FSK & PSK Differential Phase Shift Keying, Quadrature Modulation Techniques QPSK, Probability of Error and Comparison of Various Digital Modulation Techniques.

#### Module V: Digital Multiplexing

Fundamentals of Time Division Multiplexing, Electronic Commutator, Bit, Byte Interleaving T1 Carrier System, Synchronization and Signaling of T1, TDM, PCM Hierarchy, T1 to T4 PCM TDM System (DS1 to DS4 Signals)

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;  
Att: Attendance.

### Text & References:

#### Text

- Simon Haykin: "Digital Communication", John Wiley / 4<sup>th</sup> Ed.
- Bernard SKLAR: "Digital communication", Pearson education.





# AMITY UNIVERSITY

## RAJASTHAN

No. : AUR/REG/BOS/2578

Dated : 08/04/2019

**Board of Studies [BOS]**  
**Amity School of Engineering & Technology (ASET)**  
**Computer Science Engineering and Information Technology**

For structuring, revision and updating of Academic Programmes, viz. framing of Curriculum, Syllabi and Scheme of Evaluation etc. the Board of Studies of Amity School of Engineering & Technology (ASET) - Computer Science Engineering and Information Technology is re-constituted as under :

1. Dr. Pankaj Kumar Pandey Coordinator & Associate Professor - ASET : Chairperson

**Internal Subject Expert**

2. Dr. Preeti Gupta Associate Professor - ASET : Member

3. Dr. Tarun Kumar Sharma Associate Professor - ASET : Member

**External Subject Experts**

4. Dr. Harish Sharma Associate Professor : Member  
Department of Computer Sc. & Engineering  
Rajasthan Technical University, Kota

**Industry / R&D Organization Experts**

5. Mr. Tushar Srivastava Software Developer : Member  
HCL Technologies, Noida

Cdr. Vishwadeepak Singh (Retd.)  
Registrar





# AMITY UNIVERSITY

## — RAJASTHAN —

No. : AUR/REG/BOS/2580

Dated : 08/04/2019

**Board of Studies [BOS]**  
**Amity School of Engineering & Technology (ASET)**  
**Chemical Engineering**

For structuring, revision and updating of Academic Programmes, viz. framing of Curriculum, Syllabi and Scheme of Evaluation etc. the Board of Studies of Amity School of Engineering & Technology (ASET) - Chemical Engineering is re-constituted as under :

1. Dr. Pankaj Kumar Pandey Coordinator & Associate Professor - ASET : Chairperson

**Internal Subject Expert**

2. Mr. Sachin Bansal Assistant Professor - ASET : Member  
3. Mr. Rajeev Sharma Assistant Professor - ASET : Member

**External Subject Experts**

4. Dr. Sushant Upadhyay Associate Professor : Member  
Department of Chemical Engineering  
MNIT, Jaipur

**Industry / R&D Organization Experts**

5. Er. Sohan Lal Arora Founder & CEO : Member  
Aristo Chemicals Ltd., Jaipur

Cdr. Vishwadeepak Singh (Retd.)  
Registrar



# AMITY UNIVERSITY

## — RAJASTHAN —

No. : AUR/REG/BOS/2576

Dated : 08/04/2019

**Board of Studies [BOS]**  
**Amity School of Engineering & Technology (ASET)**  
**Mechanical Engineering**

For structuring, revision and updating of Academic Programmes, viz. framing of Curriculum, Syllabi and Scheme of Evaluation etc. the Board of Studies of Amity School of Engineering & Technology (ASET) - Mechanical Engineering is re-constituted as under :

1. Dr. Pankaj Kumar Pandey Coordinator & Associate Professor - ASET : Chairperson

**Internal Subject Expert**

2. Mr. Mangal Singh Sisodiya Assistant Professor - ASET : Member  
3. MR. Deepak Kachhot Assistant Professor - ASET : Member

**External Subject Experts**

4. Prof. D. N. Naresh Director : Member  
Asian Institute of Technology, Jaipur

**Industry / R&D Organization Experts**

5. Mr. Ashish Lohar Manager Operation : Member  
UltraTech Cement, Kotputli, Jaipur

Cdr. Vishwadeepak Singh (Retd.)  
Registrar



# AMITY UNIVERSITY

## — RAJASTHAN —

No. : AUR/REG/BOS/2577

Dated : 08/04/2019

**Board of Studies [BOS]**  
**Amity School of Engineering & Technology (ASET)**  
**Civil Engineering**

For structuring, revision and updating of Academic Programmes, viz. framing of Curriculum, Syllabi and Scheme of Evaluation etc. the Board of Studies of Amity School of Engineering & Technology (ASET) - Civil Engineering is re-constituted as under :

1. Dr. Pankaj Kumar Pandey Coordinator & Associate Professor - ASET : Chairperson

**Internal Subject Expert**

2. Mr. Pankaj Sharma Assistant Professor - ASET : Member

3. Mr. Shahnawaz Ansari Assistant Professor - ASET : Member

**External Subject Experts**

4. Prof. Pankaj Dhemla Head of the Department : Member  
Department of Civil Engineering  
Poornima Group of Institutions, Jaipur

**Industry / R&D Organization Experts**

5. Mr. N. K. Kumawat Senior Executive Engineer (Civil) : Member  
BSNL, Jaipur

Cdr. Vishwadeepak Singh (Retd.)  
Registrar





# AMITY UNIVERSITY

## RAJASTHAN

No. : AUR/REG/BOS/2579

Dated : 08/04/2019

### **Board of Studies [BOS]**

#### **Amity School of Engineering & Technology (ASET)** **Electronics & Communication Engineering and Electrical Engineering**

For structuring, revision and updating of Academic Programmes, viz. framing of Curriculum, Syllabi and Scheme of Evaluation etc. the Board of Studies of Amity School of Engineering & Technology (ASET) - Electronics & Communication Engineering and Electrical Engineering is re-constituted as under :

1. Dr. Pankaj Kumar Pandey Coordinator & Associate Professor - ASET : Chairperson

#### **Internal Subject Expert**

2. Dr. Pramod Kumar Bhatt Associate Professor - ASET : Member

3. Dr. Ashutosh Tripathi Assistant Professor - ASET : Member

#### **External Subject Experts**

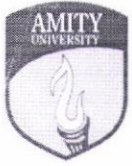
4. Dr. Praveen Jain Professor : Member  
Department of ECE  
SKIT, Jaipur

#### **Industry / R&D Organization Experts**

5. Er. Manas Manish Shukla Manager (Technical) : Member  
Uttam Bharat Pvt. Ltd., Jaipur



Cdr. Vishwadeepak Singh (Retd.)  
Registrar



# AMITY UNIVERSITY

## RAJASTHAN

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGG. / ELECTRICAL ENGG.

**ATTENDANCE SHEET FOR BOS MEETING, DATED: 23/4/19**

S.No.	Name	Designation	Details	Signature
1.	Dr. Pankaj Kumar Pandey	Coordinator & Associate Professor - ASET	Chairperson	
2.	Dr. Pramod Kumar Bhatt	Associate Professor	Member	
3.	Dr. Ashutosh Tripathi	Assistant Professor	Member	
4.	Dr. Praveen Jain	Professor, Department of ECE SKIT, Jaipur	Member	-A-
5.	Er. Manas Manish Shukla	Manager (Technical) Uttam Bharat Pvt. Ltd, Jaipur	Member	-A-



**AMITY UNIVERSITY RAJASTHAN, JAIPUR**  
**AMITY SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

**Subject: BOS Meeting, 23<sup>rd</sup> April 2019**

The agenda items were taken up and after considerable deliberations amongst the BOS members, the following decisions were taken:

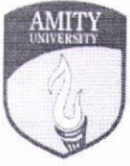
- 1- To introduce new course as under:  
B.Tech.(Electrical Engg.)
- 2- To enhance internship program
- 3- To enhance industry student interaction

The members approved the introduction of new course as mentioned in the agenda point 1. The curriculum for the course was also discussed and approved.

The meeting ends with thanks to all the members of the BOS.







# AMITY UNIVERSITY

## RAJASTHAN

DEPARTMENT OF COMPUTER SCIENCE ENGG. & INFORMATION TECHNOLOGY

**ATTENDANCE SHEET FOR BOS MEETING, DATED: 23/4/19**

S.No.	Name	Designation	Details	Signature
1.	Dr. Pankaj Kumar Pandey	Coordinator & Associate Professor - ASET	Chairperson	
2.	Dr. Tarun Kumar Sharma	Associate Professor	Member	
3.	Dr. Preeti Gupta	Associate Professor	Member	
4.	Dr. Harish Sharma	Associate Professor Department of Computer Sc. & Engineering, Rajasthan Technical University, Kota	Member	Consent taken through mail
5.	Mr. Tushar Srivastava	Software Developer HCL Technologies, Noida	Member	- do -

\* - enclosed.



**AMITY UNIVERSITY RAJASTHAN, JAIPUR**  
**AMITY SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Subject: BOS Meeting, 23<sup>rd</sup> April 2019**

The agenda items were taken up and after considerable deliberations amongst the BOS members, the following decisions were taken:

- 1- To introduce three new specialized courses in Computer Science & Engg. are as under:
  - B.Tech., Computer Science & Engg. (Artificial Intelligence & Robotics)
  - B.Tech., Computer Science & Engg. (Internet of Things)
  - B.Tech., Computer Science & Engg. (Data Science)
- 2- To enhance internship program
- 3- To enhance industry student interaction

The members approved the introduction of new courses as mentioned in the agenda point 1. The curriculum for the three courses was also discussed and approved.

The meeting ends with thanks to all the members of the BOS.



## Fw: BOS-Program Structures-CSE-ASET-AUR

Dr. Tarun Kumar Sharma

Wed 4/24/2019 4:55 PM

To: Dr. Pankaj Kumar Pandey &lt;pkpandey@jpr.amity.edu&gt;;

Dear Mam/Sir

From Dr. Harish Sharma

Thanks and Best Regards

Tarun K Sharma, Ph.D.

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**From:** harish sharma <harish.sharma0107@gmail.com>**Sent:** Monday, April 22, 2019 11:27 PM**To:** Dr. Tarun Kumar Sharma**Subject:** Re: BOS-Program Structures-CSE-ASET-AUR

Excellent sir. Its good from my side

On Mon, 22 Apr 2019, 11:31 am Dr. Tarun Kumar Sharma, <[tksharma@jpr.amity.edu](mailto:tksharma@jpr.amity.edu)> wrote:  
Dear Dr. Harish and Mr. Tushar

Greetings!

As per the market requirement and competing with Industry 4.0, we are going to introduce three new specialized courses (AI & Robotics; Data Science and IoT) in the Department of Computer Science and Engineering, Amity School of Engineering and Technology (ASET), Amity University Rajasthan, Jaipur. Being the part of the BOS you are kindly required to advise us on the same. The Program structure of the same is attached for your review and suggestions.  
Your inputs are valuable for the us as well as for the Students.

Thanks and Best Regards

Tarun K Sharma, Ph.D.

